

1 Claims

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3 1. A method of producing a bioabsorbable,
4 implantable substrate having a graded
5 molecular weight distribution, comprising the
6 steps of providing an implantable substrate
7 and altering the molecular weight distribution
8 of at least a portion of the implantable
9 substrate by exposing that portion of the
10 implantable substrate to electron beam
11 irradiation.

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13 2. A method as claimed in Claim 1 wherein the
14 molecular weight distribution of the entire
15 surface of the implantable substrate is
16 altered by exposing the entire surface of the
17 implantable substrate to electron beam
18 irradiation.

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20 3. A method as claimed in either one of Claims 1
21 and 2 wherein the implantable substrate is
22 exposed to one or more doses of electron beam
23 irradiation having an intensity of 0.1 to 10
24 MeV for 0.1 to 100 seconds and the electron
25 beam irradiation penetrates 0.1 to 40 mm from
26 the surface of the implantable substrate.

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28 4. A method as claimed in any preceding claim
29 wherein the implantable substrate is exposed
30 to more than one dose of electron beam
31 irradiation and each dose of electron beam
32 irradiation is of a different intensity.

- 1 5. The method as claimed in Claim 4 wherein each
2 dose of electron beam irradiation penetrates
3 the implantable substrate to a different
4 depth.
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- 6 6. A method of modifying the rate of
7 bioabsorbability of at least a portion of a
8 bioabsorbable, implantable substrate
9 comprising the step of exposing that portion
10 to electron beam irradiation.
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- 12 7. A bioabsorbable, implantable substrate
13 obtainable according to the method of any
14 preceding claim.
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- 16 8. A bioabsorbable implantable substrate
17 comprising a bioabsorbable polymer having a
18 graded molecular weight distribution through
19 at least a portion of its thickness.
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- 21 9. The substrate of either one of Claims 7 and 8
22 wherein the rate of bioabsorbability of the
23 implant is predetermined.
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- 25 10. The substrate of any one of Claims 7 to 9
26 having a graded molecular weight distribution
27 through the complete thickness of the
28 implantable substrate.
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- 30 11. The substrate of any one of Claims 7 to 10
31 having an outer surface and a core wherein the
32 molecular weight distribution of the

1 implantable substrate is greater at the core
2 than at the outer surface, and the rate of
3 bioabsorbability of the core is less than the
4 rate of bioabsorbability of the outer surface.

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6 12. The substrate of Claim 11 wherein the outer
7 surface and the core of the bioabsorbable
8 implantable substrate are formed from the same
9 material.

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11 13. The substrate of any one of Claims 7 to 12
12 being formed from polyglycolide (PGA),
13 polycaprolactone, polylactide (PLA),
14 poly(dioxanone) (PDO), poly(glycolide-co-
15 trimethylene carbonate) (PGA-TMC),
16 polyanhydrides, poly(propylene fumarate),
17 polyurethane, copolymers thereof or a
18 combination thereof.

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20 14. The substrate of any one of Claims 7 to 13 in
21 the form of an interference screw, suture
22 anchor, bioresorbable polymer composite, or a
23 bioabsorbable scaffold for tissue regeneration
24 and growth.

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26 15. A method of treatment of a disorder of or
27 damage to hard or soft tissue comprising the
28 step of implanting the substrate of any one of
29 Claims 7 to 14 into a human or animal body.

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31 16. A method of treatment as claimed in Claim 15
32 wherein the disorder is osteo- or rheumatoid

1 arthritis, osteoporosis, inflammatory,
2 neoplastic, traumatic or infectious tissue
3 conditions, syndromes characterised by
4 chondrodysplasia, cartilage damage, fracture,
5 ligament tears, hernia, synovitis, systemic
6 lupus erthematosus, or wounds sustained during
7 surgery.

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9 17. The substrate of any one of Claims 7 to 15 for
10 use in therapy.

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12 18. The use of the substrate of any one of Claims
13 7 to 14 in the manufacture of a medicament for
14 the repair or treatment of disorders of or
15 damage to hard or soft tissue of the human or
16 animal body.

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